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10/692,775

10/24/2003

Kenneth R. Goodman

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35204

7590

06/21/2006

SCHLUMBERGER RESERVOIR COMPLETIONS  
14910 AIRLINE ROAD  
ROSHARON, TX 77583

EXAMINER

TAYLOR, VICTOR J

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/692,775

Applicant(s)

GOODMAN, KENNETH R.

Examiner

Victor J. Taylor

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/20/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Office Action.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings were received on 18 December 2003. These drawings are approved

### ***Prior Art***

2. The prior art made of record and not relied upon is considered pertinent to applicant:

I. Gruenhagen in US 5,963,138 in class 340/679 is cited for the drilling tool 4 and apparatus of adjusting the downlink signal communication using mud-pulse telemetry in the borehole see the abstract, with the apparatus in figure 1 and controlled using the electronic controller 25 and discloses the pulsed fluid flow with the pulse amplitude and pulse duration controlled using the series of signals including the "wake-up pulse", i.e. the "a priori" pulse signals 72 in figure 1. He further discloses the signal source in the mud pulse telemetry and electronic computer on the borehole tool with the "a priori" wake up signal for the controller in figure 3 and in lines 1-65 of column 4.

II. Estes in US 4,051,907 in class 175/4.55 is cited for the borehole selective firing system using the control unit 10 in figure 1 using the switches 28 to control the firing sequence with the selected "a priori" signals with selected duty cycles and time period frequencies in lines 10-25 of column 3.

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 16-17 are rejected under 35 U.S.C. 101 because the claims are drawn to a computation method with steps for dating data samples with steps for storing and computing and comparing the computed parameters with steps of deciding that are based on computer computations that show no clear and concrete and tangible results.

See MPEP 2106 and United States Patent and Trademark Office Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility **OG Notices: 22 November 2005** and the 101 issues as found in the inter-net location, <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm>

***Response to Arguments***

4. Applicant's arguments, see the amendments of record, filed 20 December 2005, with respect to objection of the specification have been fully considered and are persuasive. The objection to the specification of 2 June 2005 is moot and has been withdrawn.

5. Applicant's arguments with respect to claim 1-20 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Schultz in US Patent 5,412,568.

With regard to claim 1, Schultz discloses the limitations for:

- a. The controller system 200 in the well 10 in figure 14.
- b. He further discloses the signal source 46 putting a fluid pressure pulse into the well 10 in figure 1.
- c. He further discloses the controller 224 in figure 14 responsive to the fluid pressure pulse figure 6 and responsive to the repeating command signal, (See the repeating pulse fluid pressure signal detected by the receiver sensor 232 in figure 14.) with the command signal previously unknown, (See the first distorted command signal sent down hole lines 1-5 in column 2 and stored there for later comparison with a second command signal.) with the controller responsive to the repeating command signal by actuating a tool. (See the operating command signal compared to the first previously stored command signal that is verified with the first stored command signal and detected in the down hole tool and used to activate the equipment in lines 17-25 of column 2.)

In addition He further discloses, as quote "The present invention provides an improved system for communicating with a remotely controlled downhole tool by means of pressure changes applied to a column of fluid standing in the well." And,

"The problem of distortion of the input command signal has been eliminated by the technique of programming the tool after it is located at its final position within the well, so that the tool will recognize the control signal in its distorted form." And,

"This is accomplished by placing the downhole tool at a downhole location in the well. The tool includes a receiver for receiving remote command signals transmitted into the well and includes a controller having memory." And,

"An original programming command signal is introduced into the well and that programming command signal is distorted as it travels down through the well to the receiver." As found in lines 50-67 of column 1.

He further disclosed "The receiver receives the distorted programming command signal and then stores that distorted programming command signal in the memory of the controller." And,

Subsequently, an original operating command signal is introduced into the well. The original operating command signal will have substantially the same signature, as did the original programming command signal when it is input into the well. The original operating command signal will be distorted as it moves down through the well, and the distortion will be substantially similar to the distortion that occurred to the original programming command signal so that when a distorted operating command signal is received downhole at the receiver, it will appear substantially the same as the distorted

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programming command signal which the receiver has now been programmed to look for." And,

"Upon receiving the distorted operating command signal and comparing it to the previously stored distorted programming command signal, the controller can verify that the original operating command signal is directed to that downhole tool. In response to this verifying, the controller performs an operation of the downhole tool commanded by the original operating command signal." And,

"Preferably, the stored programming command signal is periodically updated." And, "Numerous objects, features and advantages of the present invention will be readily apparent to those skilled in the art upon a reading of the following disclosure when taken in conjunction with the accompanying drawings." As found in lines 1-32 of column 2 and in combination with the complete Patent.

Re claim 2, which stands rejected on the rejected base claim 1, Schultz further discloses the apparatus on the borehole tool 10 comprises a computation device 226 with a memory unit 228 in the process controller 224 and a computation device process controller 230 and a signal processor 236 and a sensor device 234 in figure 14 and discloses ADP receiver sensor means digital processes in lines 30-65 of column 12.

Re claims 3-4, which stands rejected on the rejected base claim 1, Schultz further discloses the pressure source provides a pressure sequence using the pressure pumps 52 in figure 2.

Re claim 5, which stands rejected on the rejected base claim 1, Schultz further discloses the signal source provides variable flow and pressure rates 10 in figure 2 and delta t pressure rates in figure 9.

Re claim 6, which stands rejected on the rejected base claim 1, Schultz further discloses the signal source 10 in figure 1 provides variations in applied force of hydrostatic pressure in figure 10

Re claim 7, which stands rejected on the rejected base claim 1, Schultz further discloses the for the signal source provides variations in stress or strain in the wave path 10 in figure 1.

Re claims 8 and 9, which stands rejected on the rejected base claim 1, Schultz further, discloses the steps for at least one computer parameter 230 (The input data) by receiving 232 the first signal data in the buffer computation processes in figure 14. He further discloses the first signal and the second signal stored in the memory 228 and the correlation of data between the micro-processor 226 and the stored memory data 228 wherein the first stored pulse code is correlated with the matching pulse coded signal and used to actuate the driver data signal in figure 14.

With regard to claim 10, the arguments applied to independent claim 1 are applied to claim 10 for their common features.

Schultz further discloses the controller system 224 in the subterranean well 10 in figure 2 and further discloses all the limitations for claim 10 in figure 14.

- a. He further discloses the memory unit 228 in figure 14.
- b. He further discloses the microprocessor 226 units in figure 14.

c. He further discloses the buffer/driver 236 in figure 14.

d. He further discloses commonly used ADP techniques 224 in figure 14 and the ADC circuits 234 converting analog signal data to digital data 234 as used in the pressure signal receiver 232 in figure 14 and used in the borehole tool 10 in figure 4.

e. He discloses the downhole tool interface signal processor 200 in figure 14.

f. He further discloses the micro-processor 226 with the memory 228 executes a program 230 used in the controller 224 in figure 14 and responsive to the fluid pressure pulse figure 6 and responsive to the repeating command signal, (See the repeating pulse fluid pressure signal detected by the receiver sensor 232 in figure 14.) with the command signal previously unknown, (See the first distorted command signal sent down hole lines 1-5 in column 2 and stored there for later comparison with a second command signal.) with the controller responsive to the repeating command signal by actuating a tool. (See the operating command signal compared to the first previously stored command signal that is verified with the first stored command signal and detected in the down hole tool and used to activate the equipment in lines 17-25 of column 2.)

Re claim 11, which stands rejected on the rejected base claim 10 Schultz further, discloses the, the steps for sensor receiving the analog signals and converting the analog signal into a digital data signal 234 in figure 14 and stored in the buffer circuit found in the micro-processor 226 in figure 14.

Re claim 12, which stands rejected on the rejected base claim 10, Schultz further, discloses the controller 224 in figure 14 with data samples stored in the buffer

found in the micro-processor 226 storing the first signal with the use of the memory 228 and the correlation of this first stored data signal with a second data command signal 226 used to actuate the equipment using the driver 236 in figure 14 in combination with the complete patent and column 2 and column 3 in lines 1-66.

Re claims 13 to 15, which stands rejected on the rejected base claim 10, Schultz further discloses the steps for computer processes computations with recognition of signals representing command signals 232 in figure 14 and discloses the computed data 226 in figure 14 wherein "Upon receiving the distorted operating command signal and comparing it to the previously stored distorted programming command signal, the controller can verify that the original operating command signal is directed to that downhole tool. In response to this verifying, the controller performs an operation of the downhole tool commanded by the original operating command signal." And, signals are "Preferably, the stored programming command signal is periodically updated." As found in lines 1-32 of column 2 and in combination with the complete Patent.

With regard to claim 16, the arguments applied to independent claims 1 and claim 10 are applied to claim 16 for their common features.

a. Schultz further discloses the taking data samples using the controller system 224 in the subterranean well 10 in figure 14.

b. He further discloses storing the data samples in the data buffer in the microprocessor 226 in figures 14.

c. He further discloses computing data parameters using the data samples in the buffer 226 using the computation system 226 in figure 14.

d. He further discloses comparing computed parameters 226 in the correlated data 228 and the program instruction to compare the first data train to the second data train using the controller 224 in figure 14 and issued instructions to the driver 236 when the proper correlation is made 224 in figure 14.

Re claim 17, which stands rejected on the rejected base claim 16, Schultz further discloses the steps for cross-correlation 226 and teaches differences between model times and corrected times using standard deviation or other measures of difference values that encamp the equation boundaries for computing parameters for a first and second mean and a first and second deviation and a correlation coefficient in line 25 of column 9 and cites a pressure difference  $\Delta P$  in figure 16. He does not specifically cite computing a first and second mean or a first and second deviation or a correlation coefficient.

With regard to claim 18, the arguments applied to the independent claims 1 and 10 above and to claim 16 are applied to claim 18 for their common features. Schultz further discloses the all the limitations for claim 18 in figure 1.

a. He further discloses placing a controller 224 at a desired location in the well 10 using the borehole tool 200 in figure 14.

b. He further discloses sending a repeating signal 232 from a signal source 52 in a desired location in figure 2.

c. He further discloses recording samples 226 while the signal 232 is being sent in figure 14 and using the data samples in the buffer 226 and creating upper send profile and lower receive profile in the buffer 226 for cross-correlation of data in the

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computation processes 230 using stored signal data 228 in figure 14 and wherein "Upon receiving the distorted operating command signal and comparing it to the previously stored distorted programming command signal, the controller can verify that the original operating command signal is directed to that downhole tool. In response to this verifying, the controller performs an operation of the downhole tool commanded by the original operating command signal." And, signals are "Preferably, the stored programming command signal is periodically updated." As found in lines 1-32 of column 2 and in combination with the complete Patent.

d. He further discloses comparing computed parameters to predefined signal tolerances 230 using the computation computer process 226 for cross correlate the stored first signal data 228 in figure 14 wherein the micro-processor 226 with the memory 228 executes a program 230 used in the controller 224 in figure 14 and responsive to the fluid pressure pulse figure 6 and responsive to the repeating command signal, (See the repeating pulse fluid pressure signal detected by the receiver sensor 232 in figure 14.) with the command signal previously unknown, (See the first distorted command signal sent down hole lines 1-5 in column 2 and stored there for later comparison with a second command signal.) with the controller responsive to the repeating command signal by actuating a tool. (See the operating command signal compared to the first previously stored command signal that is verified with the first stored command signal and detected in the down hole tool and used to activate the equipment in lines 17-25 of column 2.)

e. He further discloses initiating actuation 226 of the driver 236 using computation processes 226 and deciding a command signal based on the comparison 226 results for actuation of the downhole tool 10 in figure 14.

Re claims 19, which stands rejected on the rejected base claim 18, Schultz further discloses the steps for computing signal correlate 226 using the data 228 in figure 14.

Re claim 20, which stands rejected on the rejected base claim 18, Schultz further discloses the steps for cross-correlation and teaches differences between model times and corrected times using standard deviation or other measures of difference values in lines 1-60 of column 2 that encamp the equation boundaries for computing parameters for a first and second mean and a first and second deviation and a correlation coefficient in line 5 of column 6.

Re claims 21 and 24, which stands rejected on the rejected base claim 18, Schultz further, discloses the steps for comparing and computing a correlation coefficient using the program 230 and the processor 226 in figure 14.

Re claims 22 and 26, which stands rejected on the rejected base claim 18, Schultz further discloses the steps for correlate the first waveform data 226 with a second waveform data signal 226 using the BHA controller 200 in figure 14.

Re claims 23 and 25, which stands rejected on the rejected base claim 18, Schultz further discloses the controller recognizes the pressure profile 226 detected by the pressure sensor 232 in figure 14 and detects a first pressure profile occurrence and a repetition pressure profile detected by the controller 68 is schematically illustrated in

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FIG. 11. The controller 68 preferably is a microprocessor 226 based controller including microprocessor 158 having a memory 160. The controller 68 can be programmed and information can be stored therein describing a desired command signal, which is to be applied to the well annulus 30. The desired command signal will in all instances include at least one annulus pressure change. As is further described below with regard to FIGS. 5-10, there are many different types of annulus pressure change, which may be programmed into controller 68. The controller 68 receives pressure signals from sensors 146 and 154 along electrical conduits 156 and 155. See lines 25-35 column 6.

Re claims 27, which stands rejected on the rejected base claim 18, Schultz further discloses computer computations with the steps for storing and computing and comparing by the controller using the pressure data signal previously unknown to the controller and read as a first pressure data and stored in the memory 228 in the controller 224 figure 14.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

V. J. Taylor

  
1 June 2006.

**BRYAN BUI**  
**PRIMARY EXAMINER**

